TITLE INDEX TO VOLUME 22 – 1986

Accumulation of Selected Trace Metals in Soils of Urban Runoff Swale Drains
– *Parker J. Wigington, Jr., Clifford W. Randall, and Thomas J. Grizzard* 73

The Accuracy of Water Use Forecasts: Evaluation and Implications
– *C. Tim Osborn, John E. Schefter, and Leonard Shabman* 101

Algal Bioassay and Gross Productivity Experiments Using Sewage Effluent in a Michigan Wetland
– *Curtis J. Richardson and Benedict R. Schwegler* 111

Alternatives to the Use of Agricultural Drainage Wells
– *R. S. Kanwar, J. L. Baker, and S. W. Melvin* 573

Analysis of Hydrilla-Inhibiting Fractions in Natural Waters: The Concept of "Fingerprinting" Through Liquid Chromatography
– *Dean F. Martin, Patricia M. Dooris, George M. Dooris, and Robert J. Bova, Jr.* 283

Anomalous Natural Sulfate in Water Wells of the Greenbrier Group, West Virginia
– *Sara A. Heller and Henry W. Rauch* 581

An Antidegradation Policy for Preserving Surface Water Quality in Florida
– *Thomas Swihart, O. Eugene Walton, Jr., and Marina Gonzalez Pennington* 665

Applicability of the Green and Ampt Infiltration Equation to Rangelands
– *Micheline Devaurs and Gerald F. Gifford* 19

Application of Computer Intensive Statistics to Parameter Uncertainty in Streamflow Synthesis
– *K. A. Cover and T. E. Unny* 495

Application of a Low-Flow Assessment Model for the Monongahela River Basin
– *Leila G. Rhue and Mitchell J. Small* 121

Assessing Potential Sources of Asbestos Fibers in Water Supplies of S. E. Quebec
– *D. W. Bacon, O. T. Coomes, A. A. Marsan, and N. Rowlands* 29

An Assessment of Uses Made of a Multipurpose Reservoir
– *Ted L. Napier, Silvana M. Camboni, and W. Richard Goe* 11

Basin Water Monitoring: Hydrologic Impact or Legal Compliance
– *Don W. Duckson, Jr.* 457

Bias in Hydrologic Prediction Using Log-Transformed Regression Models
– *Roy W. Koch and Gary M. Smillie* 717

The Case for Direct Measurement of Environmental Response to Hazardous Materials (Report)
– *John Cairns, Jr.* 841

The Chubb/Bauman Method for Estimating the Recreation Potential of Rivers: A Critical Review
– *L. Hamill* 653

Comparing Some Methods of Estimating Mean Areal Rainfall
– *Vijay P. Singh and Prabhat K. Chowdhury* 275

Comparison of Four Artificial Substrates and the Ponar Grab for Benthic Invertebrate Collection
– *Keith V. Slack, Rodger F. Ferreira, and Robert C. Averett* 237

A Comparison of Transformation Methods for Flood Frequency Analysis
– *D. Jain and V. P. Singh* 903

Discussion – "Consolidation of a Stream Quality Monitoring Network," by Dennis P. Lettenmaier, Dale E. Anderson, and Robert N. Brenner
– *James W. Male and Richard R. Noss* 1049

Reply to Discussion – "Consolidation of a Stream Quality Monitoring Network," by James W. Male and Richard R. Noss
– *Dennis P. Lettenmaier, Dale E. Anderson, and Robert N. Brenner* 1053

Designing for Dynamic Equilibrium in Streams
– *Burchard H. Heede* 351

Digitization of Arc-Shaped Time-Line Event Recording Chart: A Computer Algorithm
– *C. J. Liu and R. C. Albright* 769

Distribution of Benthic Macroinvertebrates in a Stream Exposed to Urban Runoff
– *Henry L. Garie and Alan McIntosh* 447

Domestic Wastewater Treatment by Peatlands in a Northern Climate: A Water Quality Study
– *Y. Dubuc, P. Janneteau, R. Labonte, C. Roy, and F. Briere* 297

Drought Policy in the U.S. and Australia: A Comparative Analysis
– *Donald A. Wilhite* 425

Early Stage of Hydrogeology in the United States, 1776 to 1912
– *Garald G. Parker, Sr.* 701

Ecological Consequence Assessment: Effects of Bioengineered Organisms
– *John Cairns, Jr. and James R. Pratt* 171

Economic Evaluation of On-Farm Water Management Projects
– *Rajan K. Sampath, Edward W. Sparling, Robert A. Young, and Kenneth C. Nobe* 191

Effect of Catchment Size on Phosphorus Export
– *Yves T.-Prairie and Jacob Kalff* 465

Effect of Influent Phosphorus Reductions on Great Lakes Sewage Treatment Costs
– *William C. Sonzogni and Thomas M. Heidtke* 623

Effect of Rainfall Excess Calculations on Modeled Hydrograph Accuracy and Unit-Hydrograph Parameters
– *George Garklavs and Kevin A. Oberg* 565

Effectiveness of Alum in a Weedy, Shallow Lake
– *E. B. Welch, C. L. DeGasperi, and D. E. Spyridakis* 921

The Effects of Deicing Salts on Water Chemistry in Pinhook Bog, Indiana
– *Douglas A. Wilcox* 57

Effects of Insecticide Use in a Pine Seed Orchard on Pesticide Levels in Fish
– *P. B. Bush, D. G. Neary, J. W. Taylor, Jr., and W. L. Nutter* 817

Effects of Placer Gold Mining on Primary Production in Subarctic Streams of Alaska
– *Erwin E. Van Nieuwenhuyse and Jacqueline D. LaPerriere* 91

Effects of Salinity on Preferred and Lethal Temperatures of the Mozambique Tilapia, *Oreochromis Mossambicus* (Peters)
– *Jay R. Stauffer, Jr.* 205

Effects of Suspended Solids on the Acute Toxicity of Zinc to *Daphnia Magna* and *Pimephales Promelas*
– *W. Scott Hall, Kenneth L. Dickson, Farida Y. Saleh, John H. Rodgers, Jr., Douglas Wilcox, and Azam Entazami* 913

Efficacy and Cost of Aquatic Weed Control in Small Ponds
– *Jerome V. Shireman, Douglas E. Colle, and Daniel E. Canfield, Jr.* 43

The Efficiency of Water Pricing: A Rate of Return Analysis for Municipal Water Departments
– *Lloyd J. Mercer and W. Douglas Morgan* 289

An Efficient Method of Applying Aluminum Salts for Sediment Phosphorus Inactivation in Lakes
– *Jody N. Connor and Gerald N. Smith* 661

An Efficient Response Matrix Method for Coupling a Groundwater Simulator and a Regional Agricultural Management Model
– *Pierre H. Lemoine, Eric G. Reichard, and Irwin Remson* 417

An Empirical Relation Between Volume and Peak of Direct Runoff
– *Vijay P. Singh and Hossein Aminian* 725

Environmental Designs for Streambank Protection Projects
– *Jim E. Henderson* 549

Establishing Statistical Design Criteria for Water Quality Monitoring Systems: Review and Synthesis
– *Robert C. Ward and Jim C. Loftis* 759

Estimating Peak Runoff from Field-Size Watersheds
– *Allen T. Hjelmfelt, Jr.* 267

An Evaluation of Weekly and Monthly Time Series Forecasts of Municipal Water Use
– *Sheryl L. Franklin and David R. Maidment* 611

An Examination of the Mechanisms Controlling Groundwater Gradients in Hyper-Arid Regional Sedimentary Basins
– *John W. Lloyd and John C. Miles* 471

Flood Forecasting for Tucurui Hydroelectrical Plant, Brazil
– *S. I. Solomon, E. Basso, C. Osorio, H. Melo de Moraes, and A. Serrano* 209

Fluvial Processes and Morphological Thresholds in Incised Channel Restoration
– *Michael D. Harvey and Chester C. Watson* 359

Forest Harvesting and Water: The Lake States Experience (Report)
– *Elon S. Verry* 1039

Generalization and Applications of Tracer Dispersion Data
– *Frederick A. Kilpatrick and Kenneth R. Taylor* 537

History of the Federal-State Cooperative Water Resources Research Institute Program
– *James S. Burton* 637

Identification of Solute Loading Sources to a Surface Stream
– *Rochelle L. Rittmaster and David K. Mueller* 81

Impacts of Residential Water Reuse in the Tucson Area
– *Kennith E. Foster and K. James DeCook* 753

Impacts of Water Quality Improvement on Site Visitation: A Probabilistic Modeling Approach
– *Marc O. Ribaudo, C. Edwin Young, and James S. Shortle* 559

International Conference on Water and Human Health – *Invited Paper*
– *Abel Wolman* 895

Isolation and Detection of *Giardia* Cysts from Water Using Direct Immunofluorescence (Report)
– *Stephen K. Sorenson, John L. Riggs, Peter D. Dileanis, and Thomas J. Suk* 843

Lactose Negative *Escherichia Coli* from Rangeland Streams: Source, Antibiotic Resistance, and Colicinogenicity
– *Robert C. Rychert and Gordon R. Stephenson* 39

Management of Instream Flows Through Runoff Detention and Retention
– *Bruce P. Van Haveren* 399

Discussion – "Measuring the Site-Specific Recreation Benefits Resulting from Improved Water Quality: An Upper Bound Approach," by Jack Ochs and Richard S. Thorn
– *J. Walter Milon and George Parsons* 133

Reply to Discussion -- "Measuring the Site-Specific Recreation Benefits Resulting from Improved Water Quality: An Upper Bound Approach," by J. Walter Milon and George Parsons
– *Jack Ochs and Richard S. Thorn* 135

Meeting the Challenge of Policy-Relevant Science: Lessons from a Water Resource Project
– *Berton L. Lamb* 811

Mississippi Embayment Aquifer System in Mississippi: Geohydrologic Data Compilation for Flow Model Simulation
– *J. K. Arthur and R. E. Taylor* 1021

Model Predictions of Watershed Hydrologic Components: Comparison and Verification
– *D. M. Hetrick, C. C. Travis, P. S. Shirley, and E. L. Etnier* 803

Modeling North Cascades Annual Runoff Distribution Using Drainage Basin Elevation Distribution
– *Philip Irvin* 597

Models for Water and Power Scheduling for the California State Water Project
– *M. Hossein Sabet and James Q. Coe* 587

Morphological Features of Small Streams: Significance and Function
– *Robert L. Beschta and William S. Platts* 369

Network Model for Decision-Support in Municipal Raw Water Supply
– *John W. Labadie, Dennis A. Bode, and Andrew M. Pineda* 927

Nutrient Loads to Wisconsin Lakes: Part I. Nitrogen and Phosphorus Export Coefficients
– *Nicholas L. Clesceri, Sidney J. Curran, and Richard I. Sedlak* 983

Nutrient Loads to Wisconsin Lakes: Part II. Relative Importance of Nutrient Sources
– *Nicholas L. Clesceri, Sidney J. Curran, and Richard I. Sedlak* 991

Organization of the Water Policy Process "From the Bottom Up": The Red River Valley of the North Experiment
– *David C. Harrison* 731

Policy Relevant Information and Public Attitudes: Is Public Ignorance a Barrier to Nonpoint Pollution Management?
– *Nicholas P. Lovrich, Jr., John C. Pierce, Taketsugu Tsurutani, and Takematsu Abe* 229

Pollutants Associated With Sand and Salt Applied to Roads in Minnesota
– *Gary L. Oberts* 479

Potential Benefits and Costs of Inground Storage of Imported Water (Report)
– *Donald E. Agthe* 129

Discussion – "Probable Maximum Flood Estimation – Eastern United States," by Paul B. Ely and John C. Peters
– *James H. Eychaner* 137

Reply to Discussion – "Probable Maximum Flood Estimation – Eastern United States," by James H. Eychaner
– *Paul B. Ely and John C. Peters* 139

Quantification of Instream Flow Needs of a Wild and Scenic River for a Water Rights Litigation
– *Herbert S. Garn* 745

Red Alder Leaf Litter and Streamwater Quality in Western Oregon
– *R. Lynn Taylor and Paul W. Adams* 629

Review and Analysis of Methods for Quantifying Instream Flow Requirements
– *Christopher C. Estes and John F. Orsborn* 389

Revision of the Churchill Reservoir Trap Efficiency Curves Using Smoothing Splines
– *Kenneth P. Bube and Stanley W. Trimble* 305

Runoff Prediction Using Remote Sensing Imagery
– *Stephen E. Draper and Srinivas G. Rao* 941

A Semi-Distributed Adaptive Model for Real-Time Flood Forecasting
– *Corrado Corradini, Florisa Melone, and Lucio Ubertini* 1031

Simulated Relationships Between Spectral Reflectance, Thermal Emissions, and Evapotranspiration of a Soybean Canopy
– *Allen S. Hope, Donald E. Petzold, Samuel N. Goward, and Robert M. Ragan* 1011

Simulation and Saltwater Intrusion in Volusia County, Florida
– *James W. Mercer, Barry H. Lester, Stephen D. Thomas, and Ronald L. Bartel* 951

Social Feasibility as an Alternative Approach to Water Resource Planning
– *Margaret S. Hrezo* 1001

Some Geomorphic Relationships and Hydrograph Analysis
– *W. F. Rogers and V. P. Singh* 777

Space-Time Modeling of Vector Hydrologic Sequences
– *Stuart Jay Deutsch and Jose A. Ramos* 967

Stream Improvements and Fish Response: A Bio-Engineering Assessment
– *John F. Orsborn and John W. Anderson* 381

Stream Nitrate-N Loads in Relation to Variations in Annual and Seasonal Runoff Regimes
– *A. R. Hill* 829

A Supercritical Flume for Measuring Sediment-Laden Streamflow (Report)
– *Malchus B. Baker, Jr.* 847

Tenmile Creek: A Study of Stream Relocation
– *William H. Babcock* 405

A Theoretical Framework of Flood Induced Changes in Urban Land Values
– *Graham A. Tobin and Thomas G. Newton* 67

Trickle Irrigation of Wheat Applying Renovated Wastewater
– *Gideon Oron, Joel DeMalach, and Jacob E. Bearman* 439

Two-Dimensional Dam-Break Flood-Flow Analysis for Orange County Reservoir
– *Ted V. Hromadka II and Timothy J. Durbin* 249

Two-Dimensional Diffusion-Probabilistic Model of a Slow Dam Break
– *G. L. Guymon and T. V. Hromadka II* 257

A Two-Dimensional Particle Tracking Estuarine Transport Model
– *Wen sen Chu and Sherrill Gardner* 183

University Water Resources Research and State Legislatures
– *James E. Kundell* 785

Unsaturated Flow Through Solid Waste Landfills: Model and Sensitivity Analysis
– *Alexander C. Demetracopoulos, George P. Korfiatis, Efst. L. Bourodimos, and Edward G. Nawy* 601

Use of Climate Predictions to Decide a Water Management Problem
– *Stanley A. Changnon, Jr. and Donald R. Vonnhame* 649

Utilization of Models in Water Resources
– *T. Al Austin* 49

Variability in Adjustment Preferences to Groundwater Depletion in the American High Plains
– *David E. Kromm and Stephen E. White* 791

Variability in Thermal Stratification in a Reservoir
– *Emmet M. Owens, Steven W. Effler, and Francesco Trama* 219

Voter Reactions to the 1976 Water Development and Quality Referenda in Texas
– *Fred M. Shelley, F. Andrew Schoolmaster, and Rebecca S. Roberts* 485

Wetland Ecosystem Studies from a Hydrologic Perspective
– *James W. LaBaugh* 1

AUTHOR INDEX TO VOLUME 22 – 1986

Abe, Takematsu 229
Adams, Paul W. 629
Agthe, Donald E. 129
Albright, R. C. 769
Aminian, Hossein 725
Anderson, Dale E. 1053
Anderson, John W. 381
Arthur, J. K. 1021
Austin, T. Al 49
Averett, Robert C. 237

Babcock, William H. 405
Bacon, D. W. 29
Baker, J. L. 573
Baker, Jr., Malchus B. 847
Bartel, Ronald L. 951
Basso, E. 209
Bearman, Jacob E. 439
Beschta, Robert L. 369
Bode, Dennis A. 927
Bourodimos, Efst. L. 601
Bova, Jr., Robert J. 283
Brenner, Robert N. 1053
Briere, F. 297
Bube, Kenneth P. 305
Burton, James S. 637
Bush, P. B. 817

Cairns, Jr., John 171, 841
Camboni, Silvana M. 11
Canfield, Jr., Daniel E. 43
Changnon, Jr., Stanley A. 649
Chowdhury, Prabhat K. 275
Chu, Wen-sen 183
Clesceri, Nicholas L. 983, 991
Coe, James Q. 587
Colle, Douglas E. 43
Connor, Jody N. 661
Coomes, O. T. 29
Corradini, Corrado 1031
Cover, K. A. 495
Curran, Sidney J. 983, 991

DeCook, K. James 753
DeGasperi, C. L. 921
DeMalach, Joel 439
Demetracopoulos, Alexander C. 601
Deutsch, Stuart Jay 967
Devaus, Micheline 19
Dickson, Kenneth L. 913
Dileanis, Peter D. 843
Dooris, George M. 283
Dooris, Patricia M. 283
Draper, Stephen E. 941
Dubuc, Y. 297
Duckson, Jr., Don W. 457
Durbin, Timothy J. 249

Effler, Steven W. 219
Ely, Paul B. 139
Entazami, Azam 913
Estes, Christopher C. 389
Etnier, E. L. 803
Eychaner, James H. 137

Ferreira, Rodger F. 237
Foster, Kennith E. 753
Franklin, Sheryl L. 611

Gardner, Sherrill 183
Garn, Herbert S. 745
Garie, Henry L. 447
Garklavs, George 565
Gifford, Gerald F. 19
Goe, W. Richard 11
Goward, Samuel N. 1011
Grizzard, Thomas J. 73
Guymon, G. L. 257

Hall, W. Scott 913
Hamill, L. 653
Harrison, David C. 731
Harvey, Michael D. 359
Heede, Burchard H. 351
Heidtke, Thomas M. 623
Heller, Sara A. 581
Henderson, Jim E. 549
Hetrick, D. M. 803
Hill, A. R. 829
Hjelmfelt, Jr., Allen T. 267
Hope, Allen S. 1011
Hrezo, Margaret S. 1001
Hromadka II, Ted V. 249, 257

Irvin, Philip 597

Jain, D. 903
Janneteau, P. 297

Kalff, Jacob 465
Kanwar, R. S. 573
Kilpatrick, Frederick A. 537
Koch, Roy W. 717
Korfiatis, George P. 601

Kromm, David E. 791
Kundell, James E. 785

Labadie, John W. 927
LaBaugh, James W. 1
Labonte, R. 297
Lamb, Berton L. 811
LaPerriere, Jacqueline D. 91
Lemoine, Pierre H. 417
Lester, Barry H. 951
Lettenmaier, Dennis P. 1053
Liu, C. J. 769
Lloyd, John W. 471
Loftis, Jim C. 759
Lovrich, Jr., Nicholas P. 229

Maidment, David R. 611
Male, James W. 1049
Martin, Dean F. 283
Marsan, A. A. 29
McIntosh, Alan 447
Melo de Moraes, H. 209
Melone, Florisa 1031
Melvin, S. W. 573
Mercer, James W. 951
Mercer, Lloyd J. 289
Miles, John C. 471
Milon, J. Walter 133
Morgan, W. Douglas 289
Mueller, David K. 81

Napier, Ted L. 11
Nawy, Edward G. 601
Neary, D. G. 817
Newton, Thomas G. 67
Nobe, Kenneth C. 191
Noss, Richard R. 1049
Nutter, W. L. 817

Oberg, Kevin A. 565
Oberts, Gary L. 479
Ochs, Jack 135
Oron, Gideon 439
Orsborn, John F. 381, 389
Osborn, C. Tim 101
Osorio, C. 209
Owens, Emmet M. 219

Parker, Sr., Garald G. 701
Parsons, George 133
Pennington, Marina Gonzalez 665
Peters, John C. 139
Petzond, Donald E. 1011
Pierce, John C. 229
Pineda, Andrew M. 927
Platts, William S. 369
Pratt, James R. 171

Ragan, Robert M. 1011
Ramos, Jose A. 967
Rao, Srinivas G. 941
Randall, Clifford W. 73
Rauch, Henry W. 581
Reichard, Eric G. 417
Remson, Irwin 417
Rhue, Leila G. 121
Ribaudo, Marc O. 559
Richardson, Curtis J. 111
Riggs, John L. 843
Rittmaster, Rochelle L. 81
Rodgers, Jr., John H. 913
Roberts, Rebecca S. 485
Rogers, W. F. 777
Rowlands, N. 29
Roy, C. 297
Rychert, Robert C. 39

Sabet, M. Hossein 587
Saleh, Farida Y. 913
Sampath, Rajan K. 191
Schefter, John E. 101
Schoolmaster, F. Andrew 485
Schwegler, Benedict R. 111
Sedlak, Richard I. 983, 991
Serrano, A. 209
Shabman, Leonard 101
Shelley, Fred M. 485
Shireman, Jerome V. 43
Shirley, P. S. 803
Shortle, James S. 559
Singh, Vijay P. 275, 725, 777, 903
Slack, Keith V. 237
Small, Mitchell J. 121
Smillie, Gary M. 717
Smith, Gerald N. 661
Solomon, S. I. 209
Sonzogni, William C. 623
Sorenson, Stephen K. 843
Sparling, Edward W. 191
Spyridakis, D. E. 921
Stauffer, Jr., Jay R. 205
Stephenson, Gordon R. 39
Suk, Thomas J. 843
Swihart, Thomas 665

T.-Prairie, Yves 465
Taylor, Jr., J. W. 817
Taylor, Kenneth R. 537
Taylor, R. E. 1021
Taylor, R. Lynn 629
Thomas, Stephen D. 951
Thorn, Richard S. 135
Tobin, Graham A. 67
Trama, Francesco 219
Travis, C. C. 803
Trimble, Stanley W. 305
Tsurutani, Taketsugu 229

Ubertini, Lucio 1031
Unny, T. E. 495

Van Haveren, Bruce P. 399
Van Nieuwenhuyse, Erwin E. 91
Verry, Elon S. 1039
Vonnhame, Donald R. 649

Walton, Jr., O. Eugene 665
Ward, Robert C. 759
Watson, Chester C. 359
Welch, E. B. 921
White, Stephen E. 791
Wigington, Jr., Parker J. 73
Wilcox, Douglas A. 57
Wilcox, Douglas 913
Wilhite, Donald A. 425
Wolman, Abel 895

Young, C. Edwin 559
Young, Robert A. 191